

Response to the IHEC Review of the Disproportionate Impact Methodologies

OCR's specific comments regarding the following nine IHEC recommendations are as follows:

1. It is recommended that disproportionate impact analyses be conducted in a step-wise manner.

OCR concurs with this recommendation and has already modified its disparate impact methodology to include a step-wise approach. In the first Title VI investigation that has been completed since the SAB review began (OCR File No. 5R-98-R5 (Michigan Department of Environmental Quality/Select Steel Permit)) ("Select Steel investigation"), OCR focused its impact analysis on additional impacts from the proposed Select Steel facility together with background sources of air toxics, as well as potential contributions from lead in soil and dust. As the SAB recommended, the air toxics assessment analyzed each chemical individually, and potential cancer and non-cancer impacts separately.

2. The relevance of relative burden ratio (RBR) determinations is questionable when all populations exhibit either de minimis risk or risks demanding action. In the tiered approach suggested, the Agency should consider the sequence in which these analyses are performed (i.e. determining the potential "risk" to all populations before estimating disproportionate impact).

OCR concurs that the Agency should first analyze potential risk before performing an analysis of disparate impacts. In the Select Steel investigation, for the air toxics inhalation pathway, OCR analyzed the "adverse impact" question first, using an approach based on cumulative risk assessment principles. Because OCR did not find that an adverse impact occurred in any population assessed, OCR did not proceed to analyze the issue of disparity. OCR expects to refer issues to other appropriate EPA programs when both populations in a comparison are found to be at potentially significant risk levels, and may also use a relative ratio of such risks in its Title VI disparate adverse impact determination.

3. The Agency should use the term "toxicity-weighted exposure" instead of "burden." Further, EPA needs to develop a more specific and consistent definition of "toxicity-weighted exposure" for the RBA methodology. The policy decision as to whether the toxicity-weighted exposure is considered adverse should be risk-based. The current RBA burden analyses will not provide useful information to accommodate this decision.

OCR will use a term other than "burden." OCR also generally concurs that a risk-based criterion for determining adverse impacts is appropriate where feasible. OCR believes that the underlying data used in creating an indicator of disparity, the RBR, are useful in addressing the concerns raised. The discussion related to this recommendation in the subcommittee's report (pages 2, 3, 14, 27) may suggest that the methodologies did not have the capacity to perform risk-based estimates. However, the information upon which the RBR is calculated is risk-related. In the case of the enhanced method, there is a

comparable level of detail to that found in many risk assessments. The enhanced method uses a modeled concentration of the toxicity-weighted surrogate chemical in each Census block. This surrogate chemical is a combination of multiple actual chemicals, weighted by each toxicity level, and combined for ease of exposure modeling. The modeling results of this surrogate chemical may be broken out into components, yielding a chemical-by-chemical concentration breakout by census block, by facility source, and for each source, by stack or fugitive emission.

4. COATCEM has significant potential and should be developed further. In calibrating and validating this methodology, the Agency should consider two test cases - one in which mobile and area sources are not considered significant contributors to overall exposure (e.g., rural case) and one in which area and mobile sources are important contributors to overall exposures (e.g., urban case).

As noted in the charge document provided by EPA to the SAB, COATCEM is very similar to the approach used in the Cumulative Exposure Project (CEP). In the 1996 SAB report on the CEP, the SAB stated that “[a]lthough there are some caveats regarding the content, the Committee believes that the overall conceptual framework for the Cumulative Exposure Project is scientifically sound and provides a strong basis for an integrated assessment of population exposures to toxic pollutants, and, ultimately, a means to compare exposures to multiple toxic pollutants in all media across geographical and demographic groups. It must be noted, however, that the project is very ambitious and suffers, or will be handicapped, at least in the near term, from limitations in the measurement data.” Since the SAB review of the CEP, the Agency has developed better toxics emissions data (the National Toxics Inventory, which was proposed for use with COATCEM in the OCR File No. 4R-97-R6, Louisiana Department of Environmental Quality/Shintech Permit) and has gathered additional toxics monitoring data. The Agency plans to continue to improve the CEP approach as part of the National Air Toxics Assessment, which is more fully described on the Internet at: <http://www.epa.gov/ttnuatw1/urban/nata/natapg.html>.

5. When evaluating potential risks of emitted chemicals for the purpose of determining whether or not the cumulative risks are de minimis, cancer risks and non-cancer health effects should be evaluated separately.

OCR concurs with this recommendation and applied this advice in the Select Steel investigation.

6. Given the large number of uncertainties in both the RBA and COATCEM methodologies, it is important to perform uncertainty and sensitivity analyses of each methodology. In the policy decision process, the power of these methodologies to detect differences in toxicity-weighted

exposures should be compared with an a priori identification of the level of the difference that is meaningful in a regulatory or legal sense. For example, one could define as significant situations in which the calculated risks are above de minimis levels, and the toxicity-weighted exposure ratios are larger than the uncertainty factors in the specific method.

OCR plans to work with other offices within EPA to perform uncertainty and sensitivity analyses. OCR also concurs that uncertainties in the results of assessment methods must be considered in the decision processes which rely on them.

7. An important next step in the validation procedure for both the ERBA and COATCEM methodologies will be to collect ambient monitoring data at sites included in an analysis of disproportionate impacts using these methodologies, in order to compare measured concentrations of chemicals with model-estimated concentrations.

OCR agrees that comparison of estimated ambient concentrations to ambient monitoring data is an important part of any air toxics dispersion modeling exercise. In its 1996 report on the CEP, the SAB also recommended that the Agency conduct further model performance evaluation and further describe the model's uses and limitations. As a result of this SAB recommendation, the Agency has conducted an extensive model performance evaluation, and has added greater discussion of the model to its documentation of the study. For example, the 1990 modeled air toxics estimates developed in EPA's CEP using the Assessment System for Population Exposure Nationwide (ASPEN) model were compared to measured air toxics concentrations from 81 monitoring sites across the country. Had the COATCEM modeling of air toxics in Louisiana proceeded in the Shintech investigation, results would have been compared to measurements of air toxics taken at several monitors operated by the Louisiana Department of Environmental Quality. Future modeling studies conducted by the Agency, both for Title VI purposes and in support of other objectives, should benefit from increasing efforts of state and local agencies to monitor ambient air toxic concentrations.

8. Considerations of acute exposure impacts, including irritation and odor, should be included, to the extent that methodologies are available to address such effects.

At the present time, OCR is not aware that there are adequate data available to evaluate acute health effects when conducting disparate impact analysis. In particular, peak, diurnal, and seasonal chemical release data are all lacking. However, OCR is aware of two EPA projects designed to develop additional data on acute toxicity: the Acute Reference Exposure Methods project and the Acute Exposure Guideline Levels project. Both of these projects have not been completed.

The Acute Reference Exposure (ARE) methods are being developed for Agency use to perform dose-response assessment for non-cancer effects due to acute inhalation

exposures. These methods may have wide applicability in predicting the health risks of accidental and routine acute releases of chemicals to the environment when emissions estimates are available. The methodology will be used to develop AREs, chemical-specific acute exposure values (with an uncertainty spanning an order of magnitude) that are not likely to cause adverse effects in a human population. On June 10, 1998, at the request of the EPA Office of Research and Development (ORD), the SAB Environmental Health Committee reviewed the draft ARE methodology. In response to the SAB review of the ARE, ORD is planning to strengthen the ARE methodology and then add AREs for those hazardous air pollutants that are undergoing original assessment or reassessment to the Integrated Risk Information System database. These data should make a significant contribution to help fill the void in acute toxicity data. However, several chemicals that are of concern when conducting disparate adverse impact assessments will not have assigned AREs.

The Acute Exposure Guideline Levels (AEGLs) are airborne threshold concentrations established for individual acutely toxic chemicals above which defined health effect endpoints are seen in humans. The AEGLs levels are being developed by a scientific committee representing federal and state agencies and private sector, including industry, academia and other organizations. This effort is being led by the EPA Risk Assessment Division in the Office of Pollution Prevention and Toxics to provide values necessary to determine vulnerable geographical zones and to conduct risk assessments on areas near and around potential hazardous chemical release sites. This data should also make a significant contribution to help fill the void in acute toxicity data. However, EPA is still in the process of developing the methodology for the AEGLs.

OCR plans to maintain awareness of acute impacts assessment methods and data development, both inside and outside the Agency. Any clarification which could be provided on where other acute data are available or examples of where acute exposure impacts, including irritation and odor, have been considered when conducting disparate adverse impact analysis would be quite helpful in improving the current methodologies.

9. In interacting with the residents of the communities being studied, it is critical to maintain good communications and to convey information on the studies in an understandable and complete manner, making sure that the uses and limitations of the methodologies are adequately addressed. Special care should be taken to explain the difference between “toxicity-weighted exposure” and “risk”.

OCR plans to continue to take special care to convey information on the disparate adverse impact methodologies to residents of the communities. In addition, OCR recently hired a communications outreach specialist whose primary role is to further improve OCR’s outreach and interactions with stakeholders.